



1600

RAW SEQUENCE LISTING

DATE: 03/12/2004

PATENT APPLICATION: US/09/606,129C

TIME: 14:55:08

Input Set : A:\U607921.app

Output Set: N:\CRF4\03122004\I606129C.raw

3 <110> APPLICANT: Maines, Mahin D.
 5 <120> TITLE OF INVENTION: BILIVERDIN REDUCTASE FRAGMENTS AND VARIANTS, AND
 6 METHODS OF USING BILIVERDIN REDUCTASE AND SUCH
 7 FRAGMENTS AND VARIANTS
 9 <130> FILE REFERENCE: 176/60792
 11 <140> CURRENT APPLICATION NUMBER: 09/606,129C
 12 <141> CURRENT FILING DATE: 2000-06-28
 14 <150> PRIOR APPLICATION NUMBER: 60/141,309
 15 <151> PRIOR FILING DATE: 1999-06-28
 17 <150> PRIOR APPLICATION NUMBER: 60/163,223
 18 <151> PRIOR FILING DATE: 1999-11-03
 20 <160> NUMBER OF SEQ ID NOS: 37
 22 <170> SOFTWARE: PatentIn Ver. 2.1
 24 <210> SEQ ID NO: 1
 25 <211> LENGTH: 296
 26 <212> TYPE: PRT
 27 <213> ORGANISM: Homo sapiens
 29 <400> SEQUENCE: 1
 30 Met Asn Ala Glu Pro Glu Arg Lys Phe Gly Val Val Val Val Gly Val
 31 1 5 10 15
 33 Gly Arg Ala Gly Ser Val Arg Met Arg Asp Leu Arg Asn Pro His Pro
 34 20 25 30
 36 Ser Ser Ala Phe Leu Asn Leu Ile Gly Phe Val Ser Arg Arg Glu Leu
 37 35 40 45
 39 Gly Ser Ile Asp Gly Val Gln Gln Ile Ser Leu Glu Asp Ala Leu Ser
 40 50 55 60
 42 Ser Gln Glu Val Glu Val Ala Tyr Ile Cys Ser Glu Ser Ser Ser His
 43 65 70 75 80
 45 Glu Asp Tyr Ile Arg Gln Phe Leu Asn Ala Gly Lys His Val Leu Val
 46 85 90 95
 48 Glu Tyr Pro Met Thr Leu Ser Leu Ala Ala Ala Gln Glu Leu Trp Glu
 49 100 105 110
 51 Leu Ala Glu Gln Lys Gly Lys Val Leu His Glu Glu His Val Glu Leu
 52 115 120 125
 54 Leu Met Glu Glu Phe Ala Phe Leu Lys Lys Glu Val Val Gly Lys Asp
 55 130 135 140
 57 Leu Leu Lys Gly Ser Leu Leu Phe Thr Ser Asp Pro Leu Glu Glu Asp
 58 145 150 155 160
 60 Arg Phe Gly Phe Pro Ala Phe Ser Gly Ile Ser Arg Leu Thr Trp Leu
 61 165 170 175
 63 Val Ser Leu Phe Gly Glu Leu Ser Leu Val Ser Ala Thr Leu Glu Glu
 64 180 185 190
 66 Arg Lys Glu Asp Gln Tyr Met Lys Met Thr Val Cys Leu Glu Thr Glu

P.b

ENTERED

RAW SEQUENCE LISTING

DATE: 03/12/2004

PATENT APPLICATION: US/09/606,129C

TIME: 14:55:08

Input Set : A:\U607921.app

Output Set: N:\CRF4\03122004\I606129C.raw

```

67          195          200          205
69 Lys Lys Ser Pro Leu Ser Trp Ile Glu Glu Lys Gly Pro Gly Leu Lys
70      210          215          220
72 Arg Asn Arg Tyr Leu Ser Phe His Phe Lys Ser Gly Ser Leu Glu Asn
73 225          230          235          240
75 Val Pro Asn Val Gly Val Asn Lys Asn Ile Phe Leu Lys Asp Gln Asn
76          245          250          255
78 Ile Phe Val Gln Lys Leu Leu Gly Gln Phe Ser Glu Lys Glu Leu Ala
79          260          265          270
81 Ala Glu Lys Lys Arg Ile Leu His Cys Leu Gly Leu Ala Glu Glu Ile
82          275          280          285
84 Gln Lys Tyr Cys Cys Ser Arg Lys
85      290          295
88 <210> SEQ ID NO: 2
89 <211> LENGTH: 1070
90 <212> TYPE: DNA
91 <213> ORGANISM: Homo sapiens
93 <400> SEQUENCE: 2
94 ggggtggcgc cggagctgc acggagagcg tgcccgtcag tgaccgaaga agagaccaag 60
95 atgaatgcag agcccgagag gaagtttggc gtggtggtgg ttggtgttgg ccgagccggc 120
96 tccgtgcgga tgagggactt gcggaatcca cacccttcct cagcgttcct gaacctgatt 180
97 ggcttcgtgt cgagaaggga gtcggggagc attgatggag tccagcagat ttctttggag 240
98 gatgctcttt ccagccaaga ggtggaggtc gcctatatct gcagtgaagc ctccagccat 300
99 gaggactaca tcaggcagtt ccttaatgct ggcaagcacg tccttgtgga ataccccatg 360
100 aactgtcat tggcgccgc tcaggaactg tgggagctgg ctgagcagaa aggaaaagtc 420
101 ttgcacgagg agcatgttga actcttgatg gaggaattcg ctttcctgaa aaaagaagtg 480
102 gtggggaaag acctgctgaa agggtcgctc ctcttcacat ctgaccggtt ggaagaagac 540
103 cggtttggtt tccctgcatt cagcggcacc tctcgactga cctggctggt ctccctcttt 600
104 ggggagcttt ctcttgtgtc tgccactttg gaagagcgaa aggaagatca gtatatgaaa 660
105 atgacagtgt gtctggagac agagaagaaa agtccactgt catggattga agaaaaagga 720
106 cctggtctaa aacgaaacag atatttaagc ttccatttca agtctgggtc cttggagaat 780
107 gtgccaaatg taggagtga taagaacata tttctgaaag atcaaaatat atttgtccag 840
108 aaactcttgg gccagttctc tgagaaggaa ctggctgctg aaaagaaacg catcctgcac 900
109 tgcctggggc ttgcagaaga aatccagaaa tattgctgtt caaggaagta agaggaggag 960
110 gtgatgtagc acttccaaga tggcaccagc atttggttct tctcaagagt tgaccattat 1020
111 ctctattctt aaaattaaac atgttgggga aacaaaaaaa aaaaaaaaaa 1070
114 <210> SEQ ID NO: 3
115 <211> LENGTH: 296
116 <212> TYPE: PRT
117 <213> ORGANISM: Homo sapiens
119 <400> SEQUENCE: 3
120 Met Asn Thr Glu Pro Glu Arg Lys Phe Gly Val Val Val Val Gly Val
121 1          5          10          15
123 Gly Arg Ala Gly Ser Val Arg Met Arg Asp Leu Arg Asn Pro His Pro
124          20          25          30
126 Ser Ser Ala Phe Leu Asn Leu Ile Gly Phe Val Ser Arg Arg Glu Leu
127          35          40          45
129 Gly Ser Ile Asp Gly Val Gln Gln Ile Ser Leu Glu Asp Ala Leu Ser
130          50          55          60

```

RAW SEQUENCE LISTING

DATE: 03/12/2004

PATENT APPLICATION: US/09/606,129C

TIME: 14:55:08

Input Set : A:\U607921.app

Output Set: N:\CRF4\03122004\I606129C.raw

```

132 Ser Gln Glu Val Glu Val Ala Tyr Ile Cys Ser Glu Ser Ser Ser His
133 65 70 75 80
135 Glu Asp Tyr Ile Arg Gln Phe Leu Asn Ala Gly Lys His Val Leu Val
136 85 90 95
138 Glu Tyr Pro Met Thr Leu Ser Leu Ala Ala Ala Gln Glu Leu Trp Glu
139 100 105 110
141 Leu Ala Glu Gln Lys Gly Lys Val Leu His Glu Glu His Val Glu Leu
142 115 120 125
144 Leu Met Glu Glu Phe Ala Phe Leu Lys Lys Glu Val Val Gly Lys Asp
145 130 135 140
147 Leu Leu Lys Gly Ser Leu Phe Thr Ala Gly Pro Leu Glu Glu Glu
148 145 150 155 160
150 Arg Phe Gly Phe Pro Ala Phe Ser Gly Ile Ser Arg Leu Thr Trp Leu
151 165 170 175
153 Val Ser Leu Phe Gly Glu Leu Ser Leu Val Ser Ala Thr Leu Glu Glu
154 180 185 190
156 Arg Lys Glu Asp Gln Tyr Met Lys Met Thr Val Cys Leu Glu Thr Glu
157 195 200 205
159 Lys Lys Ser Pro Leu Ser Trp Ile Glu Glu Lys Gly Pro Gly Leu Lys
160 210 215 220
162 Arg Asn Arg Tyr Leu Ser Phe His Phe Lys Ser Gly Ser Leu Glu Asn
163 225 230 235 240
165 Val Pro Asn Val Gly Val Asn Lys Asn Ile Phe Leu Lys Asp Gln Asn
166 245 250 255
168 Ile Phe Val Gln Lys Leu Leu Gly Gln Phe Ser Glu Lys Glu Leu Ala
169 260 265 270
171 Ala Glu Lys Lys Arg Ile Leu His Cys Leu Gly Leu Ala Glu Glu Ile
172 275 280 285
174 Gln Lys Tyr Cys Cys Ser Arg Lys
175 290 295
178 <210> SEQ ID NO: 4
179 <211> LENGTH: 295
180 <212> TYPE: PRT
181 <213> ORGANISM: Rattus norvegicus
183 <400> SEQUENCE: 4
184 Met Asp Ala Glu Pro Lys Arg Lys Phe Gly Val Val Val Val Gly Val
185 1 5 10 15
187 Gly Arg Ala Gly Ser Val Arg Leu Arg Asp Leu Lys Asp Pro Arg Ser
188 20 25 30
190 Ala Ala Phe Leu Asn Leu Ile Gly Phe Val Ser Arg Arg Glu Leu Gly
191 35 40 45
193 Ser Leu Asp Glu Val Arg Gln Ile Ser Leu Glu Asp Ala Leu Arg Ser
194 50 55 60
196 Gln Glu Ile Asp Val Ala Tyr Ile Cys Ser Glu Ser Ser Ser His Glu
197 65 70 75 80
199 Asp Tyr Ile Arg Gln Phe Leu Gln Ala Gly Lys His Val Leu Val Glu
200 85 90 95
202 Tyr Pro Met Thr Leu Ser Phe Ala Ala Ala Gln Glu Leu Trp Glu Leu
203 100 105 110

```

RAW SEQUENCE LISTING

DATE: 03/12/2004

PATENT APPLICATION: US/09/606,129C

TIME: 14:55:08

Input Set : A:\U607921.app

Output Set: N:\CRF4\03122004\I606129C.raw

```

205 Ala Ala Gln Lys Gly Arg Val Leu His Glu Glu His Val Glu Leu Leu
206      115      120      125
208 Met Glu Glu Phe Glu Phe Leu Arg Arg Glu Val Leu Gly Lys Glu Leu
209      130      135      140
211 Leu Lys Gly Ser Leu Arg Phe Thr Ala Ser Pro Leu Glu Glu Glu Arg
212 145      150      155      160
214 Phe Gly Phe Pro Ala Phe Ser Gly Ile Ser Arg Leu Thr Trp Leu Val
215      165      170      175
217 Ser Leu Phe Gly Glu Leu Ser Leu Ile Ser Ala Thr Leu Glu Glu Arg
218      180      185      190
220 Lys Glu Asp Gln Tyr Met Lys Met Thr Val Gln Leu Glu Thr Gln Asn
221      195      200      205
223 Lys Gly Leu Leu Ser Trp Ile Glu Glu Lys Gly Pro Gly Leu Lys Arg
224      210      215      220
226 Asn Arg Tyr Val Asn Phe Gln Phe Thr Ser Gly Ser Leu Glu Glu Val
227 225      230      235      240
229 Pro Ser Val Gly Val Asn Lys Asn Ile Phe Leu Lys Asp Gln Asp Ile
230      245      250      255
232 Phe Val Gln Lys Leu Leu Asp Gln Val Ser Ala Glu Asp Leu Ala Ala
233      260      265      270
235 Glu Lys Lys Arg Ile Met His Cys Leu Gly Leu Ala Ser Asp Ile Gln
236      275      280      285
238 Lys Leu Cys His Gln Lys Lys
239      290      295
242 <210> SEQ ID NO: 5
243 <211> LENGTH: 1081
244 <212> TYPE: DNA
245 <213> ORGANISM: Rattus norvegicus
247 <400> SEQUENCE: 5
248 ggtcaacagc taagtgaagc catatccata gagagtttgt gccagtgcc caagatcctg 60
249 aacctctgtc tgtcttcgga cactgactga agagaccgag atggatgccg agccaaagag 120
250 gaaatttggg gtggtagtgg ttggtgttgg cagagctggc tcggtgaggc tgagggactt 180
251 gaaggatcca cgctctgcag cattcctgaa cctgattgga tttgtgtcca gacgagagct 240
252 tgggagcctt gatgaagtac ggcagatttc tttggaagat gctctccgaa gccaagagat 300
253 tgatgtcgcc tatatttgca gtgagagttc cagccatgaa gactatatac ggcagtttct 360
254 gcaggctggc aagcatgtcc tcgtggaata ccccatgaca ctgtcatttg cggcggccca 420
255 ggagctgtgg gagctggccg cacagaaagg gagagtcctg catgaggagc acgtggaact 480
256 cttgatggag gaattcgaat tcctgagaag agaagtgttg gggaaagagc tactgaaagg 540
257 gtctcttcgc ttcacagcta gccactgga agaagagaga tttggcttcc ctgcgttcag 600
258 cggcatttct cgctgacct ggctggtctc cctcttcggg gagctttctc ttatttctgc 660
259 caccttgga ggcgaaaag aggatcagta tatgaaaatg accgtgcagc tggagacca 720
260 gaacaagggt ctgctgtcat ggattgaaga gaaagggcct ggcttaaaaa gaaacagata 780
261 tgtaaacctt cagttcactt ctgggtccct ggaggaagtg ccaagtgtag gggtaataa 840
262 gaacatttct ctgaaagatc aggatattt tgttcagaag ctcttagacc aggtctctgc 900
263 agaggacctg gctgctgaga agaagcgcat catgcattgc ctggggctgg ccagcgacat 960
264 ccagaagctt tgccaccaga agaagtgaag aggaagcttc agagacttct gaagggggcc 1020
265 agggtttggc cctatcaacc attcacctt agctcttaca attaaacatg tcagataaac 1080
266 a
269 <210> SEQ ID NO: 6

```

RAW SEQUENCE LISTING

DATE: 03/12/2004

PATENT APPLICATION: US/09/606,129C

TIME: 14:55:08

Input Set : A:\U607921.app

Output Set: N:\CRF4\03122004\I606129C.raw

```

270 <211> LENGTH: 6
271 <212> TYPE: PRT
272 <213> ORGANISM: Artificial Sequence
274 <220> FEATURE:
275 <223> OTHER INFORMATION: Description of Artificial Sequence: hydrophobic
276     domain of BVR
278 <220> FEATURE:
279 <221> NAME/KEY: PEPTIDE
280 <222> LOCATION: (2)
281 <223> OTHER INFORMATION: where X is any aa
283 <400> SEQUENCE: 6
W--> 284 Phe Xaa Val Val Val Val
285     1             5
288 <210> SEQ ID NO: 7
289 <211> LENGTH: 6
290 <212> TYPE: PRT
291 <213> ORGANISM: Artificial Sequence
293 <220> FEATURE:
294 <223> OTHER INFORMATION: Description of Artificial Sequence: nucleotide
295     binding domain of BVR
297 <220> FEATURE:
298 <221> NAME/KEY: PEPTIDE
299 <222> LOCATION: (2)
300 <223> OTHER INFORMATION: where X is any aa
302 <220> FEATURE:
303 <221> NAME/KEY: PEPTIDE
304 <222> LOCATION: (4)..(5)
305 <223> OTHER INFORMATION: where X is any aa
307 <400> SEQUENCE: 7
W--> 308 Gly Xaa Gly Xaa Xaa Gly
309     1             5
312 <210> SEQ ID NO: 8
313 <211> LENGTH: 8
314 <212> TYPE: PRT
315 <213> ORGANISM: Artificial Sequence
317 <220> FEATURE:
318 <223> OTHER INFORMATION: Description of Artificial Sequence:
319     oxidoreductase domain of BVR
321 <400> SEQUENCE: 8
322 Ala Gly Lys His Val Leu Val Glu
323     1             5
326 <210> SEQ ID NO: 9
327 <211> LENGTH: 29
328 <212> TYPE: PRT
329 <213> ORGANISM: Artificial Sequence
331 <220> FEATURE:
332 <223> OTHER INFORMATION: Description of Artificial Sequence: leucine
333     zipper of BVR
335 <220> FEATURE:

```

RAW SEQUENCE LISTING ERROR SUMMARY
PATENT APPLICATION: US/09/606,129C

DATE: 03/12/2004
TIME: 14:55:09

Input Set : A:\U607921.app
Output Set: N:\CRF4\03122004\I606129C.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:6; Xaa Pos. 2

Seq#:7; Xaa Pos. 2, 4, 5

Seq#:9; Xaa Pos. 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26

Seq#:9; Xaa Pos. 27, 28

Seq#:12; Xaa Pos. 3

Seq#:15; Xaa Pos. 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

Seq#:16; Xaa Pos. 5

Seq#:17; Xaa Pos. 3, 5, 6, 7

VERIFICATION SUMMARY

DATE: 03/12/2004

PATENT APPLICATION: US/09/606,129C

TIME: 14:55:09

Input Set : A:\U607921.app

Output Set: N:\CRF4\03122004\I606129C.raw

L:284 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6 after pos.:0
L:308 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7 after pos.:0
L:356 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:0
M:341 Repeated in SeqNo=9
L:406 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:12 after pos.:0
L:453 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:15 after pos.:0
L:472 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:16 after pos.:0
L:496 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:17 after pos.:0